

fresh and developed new leaves and roots, although some had been preserved in herbaria for two years and three months. The Mexican plants which Prof. Wittrock succeeded in reviving were: *Scolopendrium nigripes*; *Asplenium furcatum*, *A. Pringlei*; *Polypodium Plumula*, *P. lanceolatum*; *Cheilanthes lendigera*, *C. Szovitsii*; *Isoetes Pringlei*. *Selaginella lepidophylla*, the well-known resurrection-plant, was also cultivated, and specimens which had been kept dry in a jar for more than eleven years revived. The paper is illustrated by five partly colored plates.—THEO. HOLM.

Anatomy of carices.

A very comprehensive study of the anatomical structure of about fifty species of *Carex* has been made by M. Mazel, forming a very welcome addition to the papers which deal with anatomical characters of species. Although the author admits that he has not succeeded in finding any characters in this genus sufficient to characterize the different groups of species, he has at least made a beginning by enumerating a considerable number of peculiarities in the internal structure which undoubtedly may serve in the future as a basis for a more complete study of this genus. It seems, however, that the species selected for examination are not quite sufficient to illustrate the whole genus anatomically. For it must be remembered that we have here to do with an exceedingly large genus, of which the representatives are spread all over the world and living under the most different conditions as to climate and soil. This has not been taken into consideration, and instead of selecting about fifty species, all European excepting one, it would have been more advisable to examine the same number representing other parts of the world. North America possesses very many and most interesting species of *Carex*, which ought not to have been passed by in a "comparative" anatomical study. The Arctic region also has a considerable number of types, many of which appear again farther south, and of which the structure is better suited to illustrate the genus anatomically than a number of species from a relatively small territory. It would also have been highly desirable for the author to give a sketch of the modified structure in the varieties of a few species. This is for in-

ANTOINE MAZEL: Etudes d'anatomie comparée sur les organes de végétation dans le genre *Carex*. pp. 213 7 plates. Genève 1891.

stance well marked in the different forms of *Carex vulgaris*, *hirta*, etc.

It is a little curious to see that the author considers the character of hairiness as being so very rare in *Carex*, and that he only mentions this fact for *C. hirta*, while it is also to be found in *C. pallescens*, *pilosa* and many North American species, e. g., *C. virescens*, *castanea*, *aestivalis* and *triceps*.

But otherwise this paper contains many interesting details and proves a skillful and careful research. The first chapter gives a general view of the structure of the vegetative organs, while the second contains a microscopical analysis of the species.

Concerning the leaf-structure the author points out several divergences, taken from the epidermis itself, the stomates, the epidermal expansions, the strength of the stereome, the distribution and shape of the mestome bundles, the reservoirs, etc. Among the reservoirs the author has discovered that those containing tannin are present in several species. He has observed them in the mesophyll, close to the lacunes and just under the epidermis. This is the more interesting since the Cyperaceæ formerly like the Gramineæ and the Ranunculaceæ were considered exceptional in not possessing any reservoirs.¹ The author has, however, not only observed them in the leaf but also in the aerial stem and the rhizome of certain species.

The general structure of the leaf seems to be very uniform, there being a whole series of intermediate forms between the nearly triangular leaf of *C. Davalliana* and the broad and flat leaves of *C. maxima*, *riparia* and others.

There is also given a very detailed account of the tissues in the aerial stem and the rhizome. The aerial shows like the leaf a general plan, which is, however, still more distinct than in the leaf. The epidermis does not show so many differences as in the leaf with its superior and inferior face, and it is rather difficult to observe any essential divergences. It might seem that the sharply triangular stems of several species would furnish reliable characters so as to distinguish them from those in which the stem is nearly terete; but the author calls attention to the fact that the same stem is often not triangular in its whole length.

Among the characters derived from the stem it may be men-

¹Cfr. SACHS: Vorlesungen über Pflanzenphysiologie 1887, p. 186.

tioned that the mestome-bundles form a different number of rows in certain species, varying from one to four as in *C. Grayii*. The rhizome shows even in its external anatomy a few characteristic differences, if we consider the stoloniferous and cespitose forms. But the internal structure gives still more and very characteristic differences, observable in the stereome, the lacunes, the endodermis, etc. As to the root, the author has observed also here a certain variation. The endodermis and the pericambium does not form a closed ring in all species, but the latter is most often interrupted by the hadrome, as described by Van Tieghem as characteristic for Xyrideæ, Eriocaulaceæ, Juncaceæ and a few other families.

The author is undoubtedly correct, when in the following chapter, where he gives an anatomical sketch of the species in question, he remarks that the characters to some extent may prove to be of specific value, but that it would be impossible from the present study to draw any conclusion as to the mutual relationship of the species described.—THEO. HOLM.

BRIEFER ARTICLES.

Cryptomitrium tenerum Austin.—Mr. O. F. Cook of Syracuse University had the kindness to send me, on my request, a specimen of the above named hepatic, which, being rather imperfectly described by its author, I have undertaken to examine thoroughly, so that the exact systematic position of this very interesting plant may with safety be established. Before going into details as to the relationship of this plant, I give a description of it, as follows :

CRYPTOMITRIUM TENERUM (Hooker) Austin.

Marchantia tenera Hooker in Kunth. Syn. plant. I. p. 45.

Duvalia tenera Gottsche: Synopsis Hepat. p. 554.

Plantae frondosae, terrestres, membranaceae, tenerae, minores, virides, arcte repentes.

Frons oblonga, repetito furcata vel monopodialiter ramosa (furca fertili brevi, altera furca solum increscente). Adsunt etiam rami steriles cum basi angustata ex apice frondis orti vel alii rami adventivi postici e costae latere orti. *Costa* pro plantae tenuitate sat crassa, angusta, in alas sensim attenuata, sub alis evanida, cellulis aequimagnis (corticalibus minoribus) aedificata, *alae* latissimae valde attenuatae, margine tenuissimo unistrato. *Stratum* aëriferum humile, cavernosum; *cavernae* amplae unistratae vacuae i. e. filis vel laminulis acces-